ORDER NO. DPD83060010C8

# Service Manual

Fully Automatic Turntable System

# SL-B310
# SL-B310(K)

[E], [EK], [EG], [Ei], [EC], [EB], [EH], [XL], [EF], [XA], [XM]

Areas

* [E] is available in Switzerland and Scandinavia.
* [EK] is available in United Kingdom.
* [EG] is available in F.R. Germany.
* [Ei] is available in Italy.
* [EC] is available in Czechoslovakia.
* [EB] is available in Belgium.
* [EH] is available in Holland.
* [XL] is available in Australia
* [EF] is available in France.
* [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
* [XM] is available in Central South America.

T4P is the standard mark for plug-in-connector type. Products carrying this mark are interchangeable and adaptable among each other.

* The colors of this model include silver and black.
* The black type model is provided with (K) in the Service Manual.

English

## Specifications

Specifications subject to change without notice.
Weight and dimensions shown are approximate.

### ■ General

| | |
|---|---|
| **Power supply:** | 220V, 50 Hz (For Continental Europe) |
| **Power consumption:** | 2 W |
| **Dimensions: (W×H×D)** | 43 × 10 × 37.5 cm<br>(16-15/16" × 3-15/16" × 14-3/4")<br>Maximum height when top (dust cover) is open.<br>43 × 37 × 41 cm<br>(16-15/16" × 14-9/16" × 16-1/8") |
| **Weight:** | 3.8 kg (8.4 lb.) |

### ■ Turntable section

| | |
|---|---|
| **Type:** | Fully automatic turntable<br>Auto start<br>Auto return<br>Auto stop<br>Manual play |
| **Drive method:** | Belt drive |
| **Motor:** | DC motor |
| **Drive control method:** | DC servo control |
| **Turntable platter:** | Aluminum die-cast<br>Diameter 30.4 cm (12 inches) |
| **Turntable speeds:** | 33-1/3 rpm and 45 rpm |
| **Wow and flutter:** | 0.045% WRMS (JIS C5521)<br>±0.06% peak<br>(IEC 98A Weighted) |
| **Rumble:** | −70 dB (IEC 98A Weighted) |

### ■ Tonearm section

| | |
|---|---|
| **Type:** | Statically-balanced straight tonearm<br>Plug-in connector cartridge system |
| **Effective length:** | 230 mm (9-1/16") |
| **Overhang:** | 15 mm (19/32") |
| **Tracking error angle:** | Within 2°32' at the outer groove of 30 cm (12") record<br>Within 0°32' at the inner groove of 30 cm (12") record |
| **Effective mass:** | 13.5 g (including cartridge) |
| **Stylus pressure.** | 1.25 g |
| **Applicable cartridge weight:** | 6 g |

### ■ Cartridge section

| | |
|---|---|
| **Type:** | Moving magnet stereo cartridge |
| **Magnet circuit:** | All laminated core |
| **Frequency response** | 10 Hz~35 kHz<br>20 Hz~10 kHz ±1 dB |
| **Output voltage:** | 2.5 mV at 1 kHz, 5 cm/s. zero to peak lateral velocity<br>(7 mV at 1 kHz, 10 cm/s. zero to peak 45° velocity [DIN 45 500]) |
| **Channl separation:** | 22 dB at 1 kHz |
| **Channel balance:** | Within 2 dB at 1 kHz |
| **Recommended load impedance:** | 47 kΩ~100 kΩ |
| **Compliance (dynamic):** | $12\times10^{-6}$ cm/dyne at 100 Hz |
| **Stylus pressure range:** | 1.25 ±0.25 g (12.5± 2.5 mN) |
| **Weight:** | 6 g (cartridge only) |
| **Replacement stylus:** | EPS-27CS |

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

- The power supply for this unit varies depending upon the areas. Also, the parts used for power supply are different. So, refer to the circuit diagram and the replacement parts list.
  - ★ 220V (50/60 Hz) for Continental Europe.
  - ★ 240V (50/60 Hz) for United Kingdom and Australia.
  - ★ 110V-120V/220V-240V (50/60 Hz) for other areas. [XA] for other areas is provided with voltage selector.

Deutsch

# TECHNISCHE DATEN

Änderungen der technischen Daten vorbehalten.
Die angegebenen Gewichts- und Abmessungsdaten sind ungefahre Werte.

## ■ Allgemeine Daten

**Stromversorgung:** 220V, 50 Hz

**Leistungsaufnahme:** 2 W

**Abmessungen (B×H×T):** 43 × 10 × 37,5 cm
(Maximale Höhe bei geöffnetem Oberteil (Staubabdeckung). 43 × 37 × 41 cm)

**Gewicht:** 3,8 kg

## ■ Plattenspieler

**Typ:** Automatischer Plattenspieler
Startautomatik
Rückführautomatik
Stopautomatik
Manueller Betrieb

**Antrieb:** Riemenantrieb

**Motor:** Gleichstrommotor

**Antriebsregel-Methode:** Gleichstrom-Servo-Steuerung

**Plattenteller:** Aluminium-Spritzguß
Durchmesser 30,4 cm

**Plattenteller-Drehzahlen:** 33-1/3 und 45 U/min

**Gleichlaufschwankungen:** 0,045% WRMS (JIS C5521)
±0,06% Spitze (IEC 98A bewertet)

**Rumpel-Geräuschspannungsabstand:** −70 dB (IEC 98A bewertet)

## ■ Tonarm

**Typ:** Statish balancierter, gerader Tonarm
Tonabnehmersystem vom Einsteck-Typ

**Effektive Länge:** 230 mm

**Überhang:** 15 mm

**Spurfehlwinkel:** 2°32' bei der Einlaufrille einer 30 cm-Platte
0°32' bei der Auslaufrille einer 30 cm-Platte

**Effektive Masse:** 13,5 g (einschließlich Tonabnehmer)

**Auflagekraft-Einstellbereich:** 1,25 g

**Zulässiger Tonabnehmer-Gewichtbereich:** 6 g

## ■ Tonabnehmer

**Typ:** Stereo-Magnet-Tonabnehmer mit Einpunkt-Aufhängungssystem

**Magnetkreis:** Ganzlamellenkern

**Frequenzgang:** 10 Hz bis 35 kHz
20 Hz bis 10 kHz ±1 dB

**Ausgangsspannung:** 2,5 mV bei 1 kHz
5 cm/s. Null-zu-Spitze, lateral
[7 mV bei 1 kHz 10 cm/s. Null-zu-Spitze, 45° (DIN 45 500)]

**Kanaltrennung:** 22 dB bei 1 kHz

**Kanalabweichung:** Innerhalb 2 dB bei 1 kHz

**Empfohlene Endimpedanz:** 47 kΩ~100 kΩ

**Nachgiebigkeit (dynamisch):** $12 \times 10^{-6}$ cm/dyn bei 100 Hz

**Auflagekraft-Einstellbereich:** 1,25 ±0,25 g (12,5 ±2,5 mN)

**Gewicht:** 6 g (nur Tonabnehmer)

**Ersatznadel:** EPS-27CS

Français

# CARACTERISTIQUES

Les spécifications sont susceptibles d'être modifiées sans préavis.
Le poids et les dimensions donnés sont approximatifs.

## ■ Généralités

**Alimentation:** 220V, 50Hz

**Consommation:** 2 W

**Dimensions: (L×H×P)** 43 × 10 × 37,5 cm
(Hauteur maximum lorsque le dessus (couvercle protègepoussière) est ouvert 43 × 37 × 41 cm)

**Poids:** 3,8 kg

## ■ Platine de lecture

**Type:** Platine automatique
Démarrage automatique
Retour automatique
Arrêt automatique
Audition à commande manuelle

**Système d'entraînement:** Entraînement par courroie

**Moteur:** Moteur C.C.

**Groupe de réglage:** Servocommande à C.C.

**Plateau de lecture:** En aluminium moulé sous pression
Diamètre 30,4 cm

**Vitesses de rotation:** 33-1/3 et 45 t/p.m.

**Pleurage et scintillement:** 0,045% de valeur efficace (JIS C5521)
±0,06% de crête (IEC 98A Pondéré)

**Ronflement:** −70 dB (IEC 98A Pondéré)

## ■ Bras de lecture

**Type:** Bras de lecture rectiligne statiquement équilibré
Système de cellule de lecture à connecteur enfichable

| | |
|---|---|
| **Longueur effective:** | 230 mm |
| **Porte-à-faux:** | 15 mm |
| **Angle d'erreur de piste:** | En deçà de 2°32' au sillon extérieur d'un disque de 30 cm<br>En deçà de 0°32' au sillon intérieur d'un disque de 30 cm |
| **Masse réelle:** | 13,5 g (y compris la cellule pick-up) |
| **Plage de réglage de la pression d'appui:** | 1,25 g |
| **Gamme du poids des cellules pick-up utilisables:** | 6 g |

### ■ Cellule pick-up

| | |
|---|---|
| **Type:** | Cellule pick-up stéréo à aimant mobile |
| **Circuit magnétique:** | Noyau entièrement feuilleté |
| **Réponse en fréquence:** | 10 Hz à 35 kHz<br>20 Hz à 10 kHz ±1 dB |
| **Tension de sortie:** | 2,5 mV à 1kHz; 5 cm/s., zéro à vitesse latérale de crête<br>(7 mV à 1 kHz 10 cm/s., zéro à vitesse 45° de crête<br>[DIN 45 500]) |
| **Séparation des canaux:** | 22 dB à 1 kHz |
| **Equilibrage des canaux:** | En deçà de 2 dB à 1 kHz |
| **Impédance de charge recommandée:** | 47 kΩ~100 kΩ |
| **Elasticité (dynamique):** | 12 × $10^{-6}$cm/dyne à 100 Hz |
| **Plage de la force verticale d'appui:** | 1,25 ±0,25 g (12,5 ±2,5 mN) |
| **Poids:** | 6 g (cellule seule) |
| **Pointe de lecture de remplacement:** | EPS-27CS |

Español

# ESPECIFICACIONES

Las especificaciones quedan sujetas a cambios sin aviso previo.
El peso y las dimensiones indicados son aproximados.

### ■ En general

| | |
|---|---|
| **Alimentación de corriente:** | 220 V, 50 Hz |
| **Consumo de corriente:** | 2 W |
| **Dimensiones:** | 43 × 10 × 37,5 cm |
| **(Ancho×Alto×Prof.)** | (Altura máxima cuando la parte de arriba (tapa contra el polvo) está abierta. 43 × 37 × 41 cm) |
| **Peso:** | 3,8 kg |

### ■ Sección del plato giratorio

| | |
|---|---|
| **Tipo:** | Plato giratorio automático<br>Arranque automático<br>Retorno automático<br>Parada automática<br>Ejecución manual |
| **Método de accionamiento:** | Accionamiento por correa |
| **Motor:** | Motor de corriente continua |
| **Método de control de accionamiento:** | Servocontrol por corriente continua |
| **Platillo del plato giratorio:** | Aluminio fundido<br>Diámetro 30,4 cm |
| **Velocidades del plato giratorio:** | 33-1/3 y 45 rpm |
| **Ululaciones y trémolo:** | 0,045% WRMS (JIS C5521)<br>±0,06% cresta<br>(IEC 98A Ponderado) |
| **Ruido de rodadura:** | −70 dB (IEC 98A Ponderado) |

### ■ Sección del brazo sonoro

| | |
|---|---|
| **Tipo:** | Brazo sonoro recto equilibrado estáticamente<br>Sistema de cartucho con conector enchufable |
| **Longitud efectiva:** | 230 mm |
| **Proyección:** | 15 mm |
| **Angulo de error de seguimiento:** | Inferior a 2°32' en el surco exterior de un disco de 30 cm<br>Inferior a 0°32' en el surco interior de un disco de 30 cm |
| **Masa efectiva:** | 13,5 g (incluyendo el cartucho) |
| **Radio de ajuste de la presión de la aguja:** | 1,25 g |
| **Radio de peso de cartucho utilizable:** | 6 g |

### ■ Sección del cartucho

| | |
|---|---|
| **Tipo:** | Cartucho estereofónico de imán móvil |
| **Circuito magnético:** | Núcleo totalmente laminado |
| **Respuesta de frecuencia:** | 10 Hz a 35 kHz<br>20 Hz a 10 kHz ±1 dB |
| **Voltaje de salida:** | 2,5 mV a 1 kHz<br>Con velocidad lateral de cero a cresta de 5 cm/s<br>[7 mV a 1 kHz Velocidad de 45° de cero a cresta de 10 cm/s (DIN 45 500)] |
| **Separación de canales:** | 22 dB a 1 kHz |
| **Equilibrio de canales:** | Sin exceder 2 dB a 1 kHz |
| **Impedancia de carga recomendada:** | 47 kΩ a 100 kΩ |
| **Elasticidad (dinámica):** | 12 × $10^{-6}$cm/dina a 100 Hz |
| **Radio de presión de la aguja:** | 1,25 ±0,25 g (12,5 ±2,5 mN) |
| **Peso:** | 6 g (cartucho sólo) |
| **Aguja de recambio:** | EPS-27CS |

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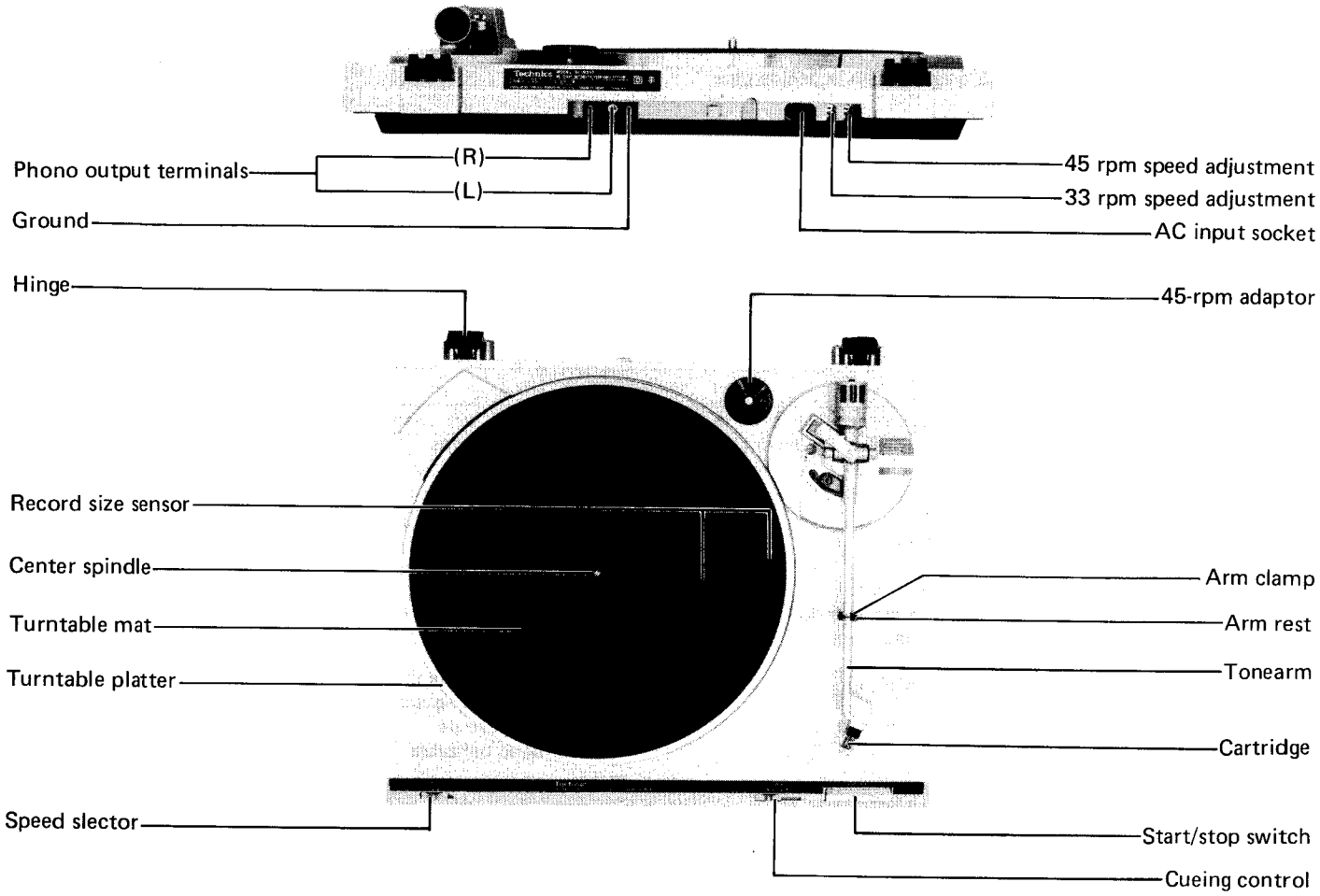
## ■ LOCATION OF CONTROLS




## ■ SAFETY PRECAUTIONS

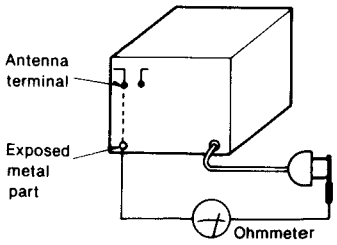
1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

### • INSULATION RESISTANCE TEST

1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3MΩ and 5.2MΩ to all exposed parts. (Fig. 1–1) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. 1–2)

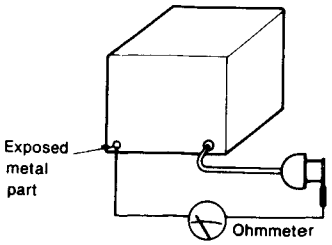
**Note:** Some exposed parts may be isolated from the chassis by design. These will read infinity.

4. If the measurement is outsede the specified limits, there is a possibility of a shock hasard. The equipment should be repaired and rechecked before it is returned to the customer.




Resistance = 3MΩ—5.2MΩ

**(Fig. 1–1)**




Resistance = Approx ∞

**(Fig. 1–2)**

# ■ DISASSEMBLY INSTRUCTIONS

## • How to remove the cartridge (Fig. 2)

1. Fix the tonearm on the arm rest.
2. Remove the cartridge setscrew ❶ .
3. Pull out the cartridge with care not to let the hand touch the stylus tip.
4. When setting the cartridge, match the cartridge pin with the tonearm connector, and completely insert the cartridge and tighten the setscrew.

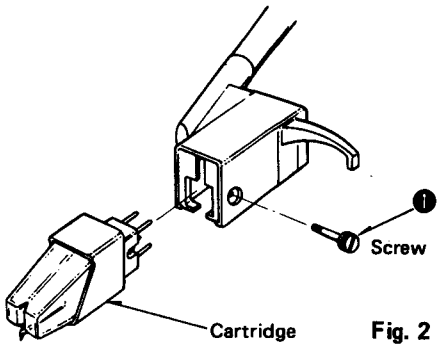



Fig. 2

## • How to remove the stylus (Fig. 3)

1. Pull out the stylus with care not to touch the stylus tip.
2. When setting the stylus, match the stylus sleeve with the fitting hole in the cartridge body, and completely insert the stylus and make sure that there is no gap between the stylus knob and main body.

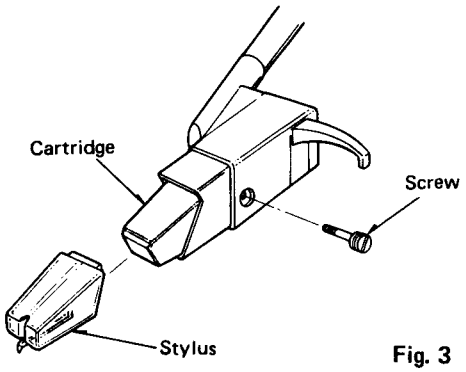



Fig. 3

## • How to remove the bottom board (Fig. 4)

1. Fix the tonearm on the arm rest.
2. Remove the turntable mat, belt and turntable platter.
3. Close the dust cover, and turn over the unit with care.
4. Remove the 5 setscrews [ **Fig. 4:** ❷ ~ ❻ ] of the bottom board.

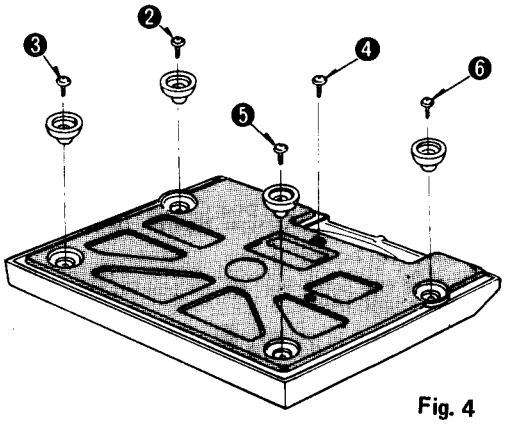
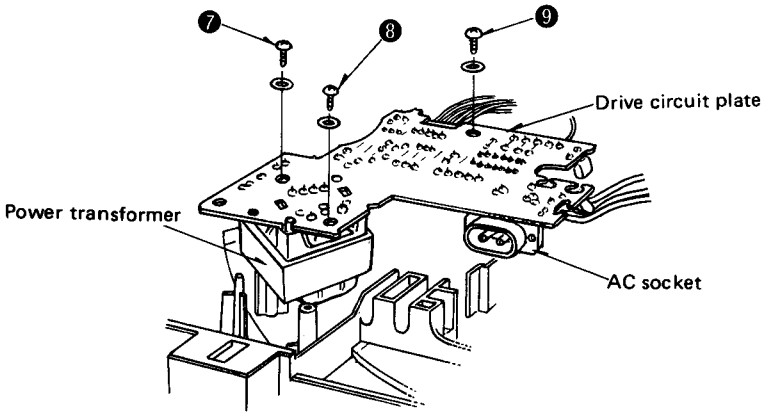


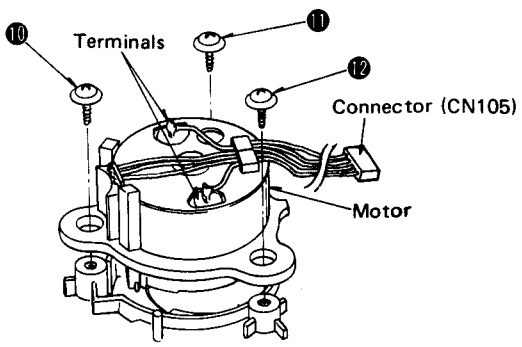

Fig. 4

## • How to remove the drive circuit P.C.B. (transformer) and motor

1. Remove the bottom board. (Refer to "How to remove the bottom board".)
2. Remove the 3 setscrews [ **Fig. 5** Ⓐ : ❼ ~ ❾ ] of the P.C.B., then the drive circuit P.C.B. (transformer) and AC socket can be removed.
3. To remove the transformer from the drive circuit P.C.B., unsolder the 5 transformer terminals and release the claw to remove the transformer from the P.C.B.
4. To remove the motor, remove the 3 setscrews [ **Fig. 5** Ⓑ : ❿ ~ ⓬ ] which secure the main body and motor, and then pull out the connector (CN105) in the P.C.B.




Ⓐ




Ⓑ

Fig. 5

- **How to remove the mechanical plate (Fig. 6)**

1. Remove the bottom board.(Refer to "How to remove the bottom board".)
2. Remove the 9 setscrews [ **Fig. 6:** ⑬ ~ ㉑ ] of the mechanical plate and output terminal shielding plate, and the setscrew ㉒ of the Ground terminal.
3. When fitting the mechanical plate, do the following beforehand.
   (1) Turn the turntable shaft to rotate the main gear until it comes to the no-gear part. **(Fig. 7)**
   (2) Shift the cueing lever of the mechanical plate to the "cueing up" position. **(Fig. 8)**

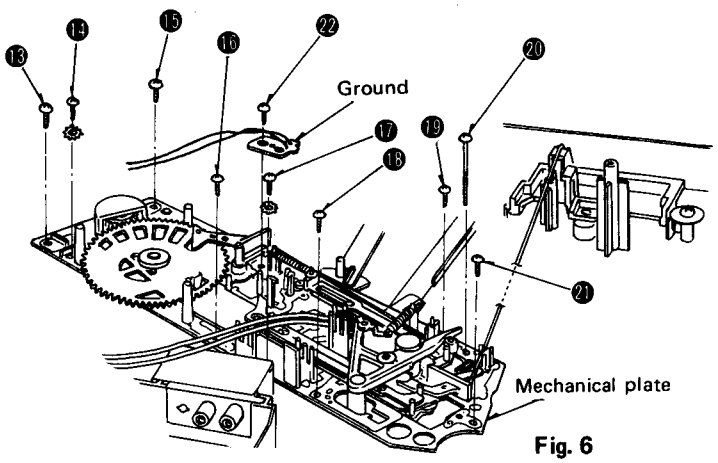



Fig. 6

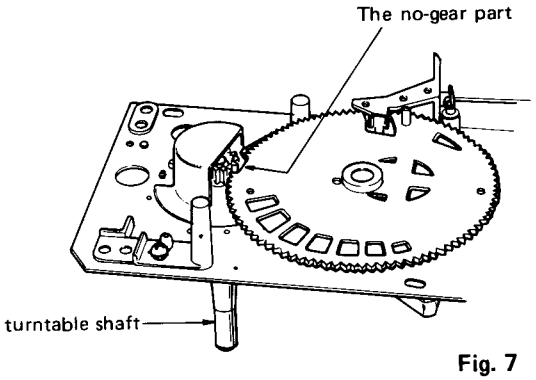



Fig. 7

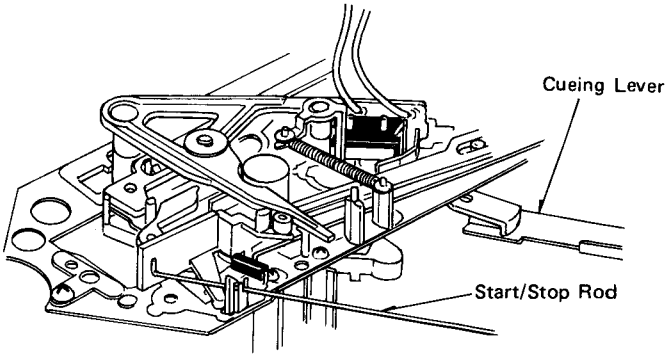



Fig. 8

- **How to remove the Pu fixing plate (Fig. 9)**

1. Remove the bottom board.(Refer to "How to remove the bottom board".)
2. Remove the mechanical plate. (Refer to "How to remove the mechanical plate".)
3. Remove the setscrew ㉓ of the Pu fixing plate.

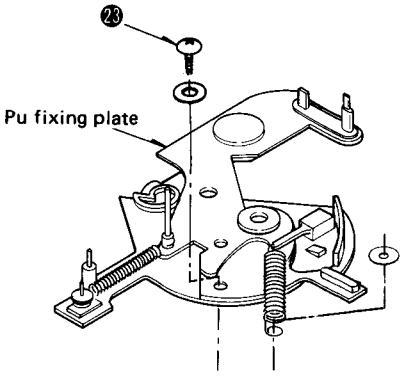



Fig. 9

- **How to remove the tonearm (Fig. 10)**

1. Remove the Pu fixing plate. (Refer to "How to remove the Pu fixing plate".)
2. Unsolder the 5 Pu leads of output terminal.
3. Remove the 2 setscrews [ **Fig. 10:** ㉔ ~ ㉕ ] of the lift plate.

Pu lead wiring method

| | |
|---|---|
| White | L CH (+) terminal |
| Blue | L CH (–) terminal |
| Red | R CH (+) terminal |
| Green | R CH (–) terminal |
| Black | Ground terminal |

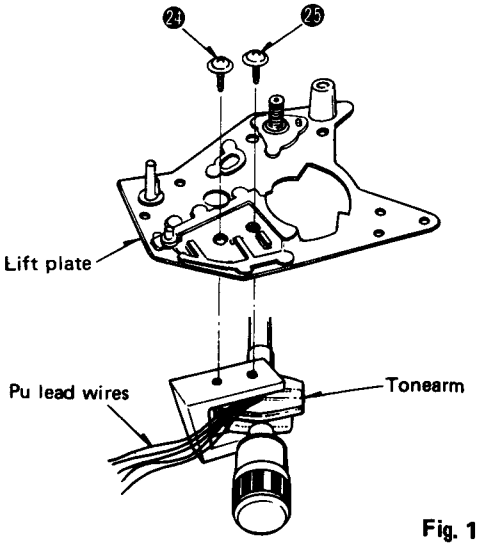



Fig. 10

### • How to remove the lift plate (Fig. 11)

1. Remove the Pu fixing plate. (Refer to "How to remove the Pu fixing plate".)
2. Remove the 3 setscrews [ **Fig. 11:** ㉕ ~ ㉗ ] of the lift plate.

### • How to remove the arm lift

1. Remove the Pu fixing plate. (Refer to "How to remove the Pu fixing plate".)
2. Remove the lift plate (Refer to "How to remove the lift plate".)
3. Remove the setscrew [ **Fig. 12:** ㉙ ] of the arm lift cover.
4. Remove the washer [ **Fig. 12:** ㉚ ] from the arm lift rod.
5. Pull out the arm lift rod in the direction of the arrow.

**Caution:**

★ Be sure to adjust the arm lift height. (Refer to page 7 **Fig. 13**.)

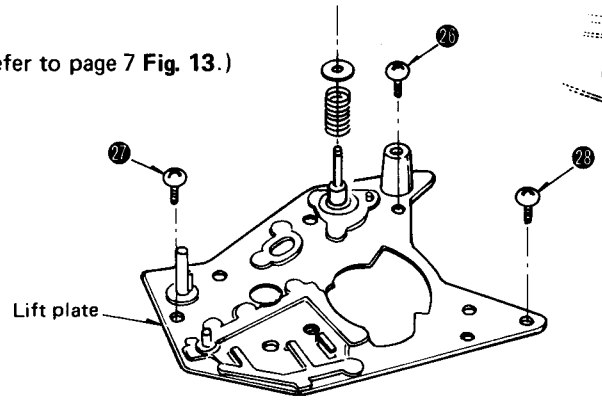



Fig. 11

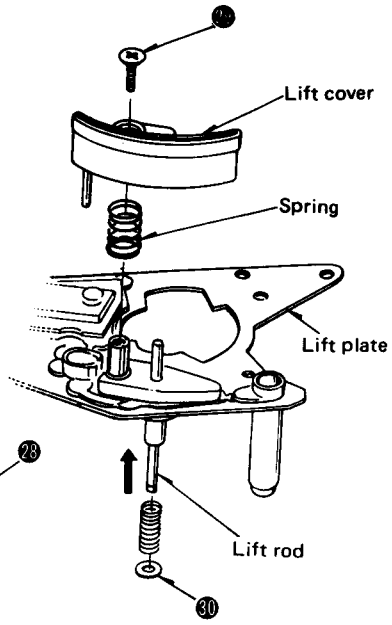



Fig. 12

## ■ MEASUREMENTS AND ADJUSTMENT — English

### • Arm-lift height adjustment

The arm-lift height (distance between the stylus tip and the record surface when the cueing control is at the " ▼ " position) has been adjusted at the factory to approximately 5 to 7 mm (5/32" ~ 1/4"). **(Fig. 13)**

If the clearance is too narrow or too wide, turn the adjustment screw clockwise or counterclockwise. **(Fig. 14)**

**Clockwise rotation**

–distance between the record and stylus tip is decreased.

**Counterclockwise rotation**

–distance between the record and stylus tip is increased.

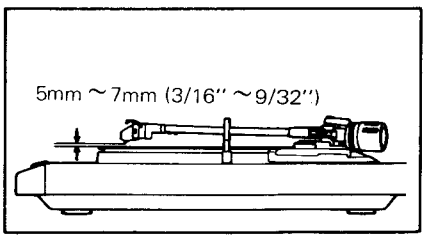



Fig. 13

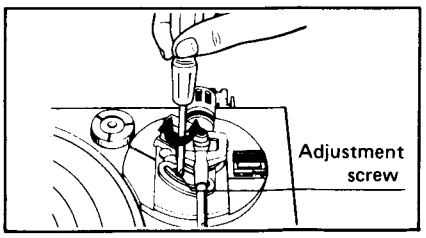



Fig. 14

### • Adjustment of automatic start position (Fig. 15)

> **Note:**
> The auto-start and auto-return adjustment screws are located together.
> When the tonearm is in or near the arm rest, the auto-start adjustment screw is visible **(Fig. 15)**; when the tonearm is near the center of a record, the auto-return adjustment screw is visible. **(Fig. 16)**

If the stylus does not land in the lead-in groove, adjust as follows

1. Clamp the tonearm to the arm rest.
2. Remove the rubber cap. **(Fig. 15)**
3. Turn the screw with a screwdriver, clockwise or counterclockwise as necessary.

If the stylus tip sets down too far in the recorded groove,

**–turn counterclockwise.**

If the stylus tip sets down outside of the record,

**–turn clockwise.**

Adjust so the stylus tip lands 1~2 mm in from the edge of the record.

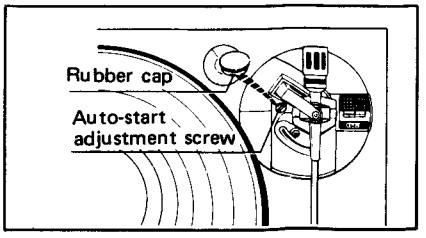



Fig. 15

### • Adjustment of automatic return position (Fig. 16)

(Remove the rubber cap.)

1. Put the stylus protector on the cartridge.
2. Move the tonearm toward the center of the record.
   The auto-return adjustment screw will appear.

If the tonearm tends to return to the arm rest before the play has finished,

**—turn counterclockwise.**

If the tonearm fails to return after the final groove,

**—turn clockwise.**

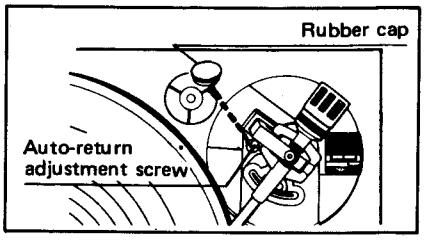



**Fig. 16**

### • Adjustment of rotational speed

1. Set the speed selector switch to the "45" position.
2. Turn the VR102 with a screw driver from the back of the set to the rated rotation (45 rpm) and check the rotation with a strobe while adjusting the speed. **(Fig. 17)**
3. Set the speed selector switch to the "33" position.
4. Turn the VR101 with a screwdriver from the back of the set to the rated rotation (33—1/3 rpm) and check the rotation with a strobe while adjusting the speed. **(Fig. 17)**

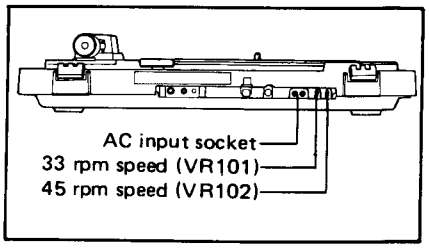



**Fig. 17**

## ■ MESSUNGEN UND JUSTIERUNGEN ■■■■■■■■■■ Deutsch ■■■■■■■■■■

### • Justierung der Tonarmlifhöhe

Die Tonarmlifthöhe, d.h. der Abstand zwischen Nadelspitze und Schallplattenoberfläche bei Liftsteuerungs-Position "▼", wurde werkseitig auf ca. 5—7 mm eingstellt. **(Abb. 13)**

Falls der Abstand zu groß oder zu klein ist, drehen Sie die Justierschraube im Uhrzeigersinn oder enfgegen dem Uhrzeigersinn. **(Abb. 14)**

**Drehung im Uhrzeigersinn**

—Der Abstand zwischen der Platte und der Nadelspitze wird kleiner.

**Drehung entgegen dem Uhrzeigersinn**

—Der Abstand zwischen der Platte und der Nadelspitze wird größer.

### • Justierung des Abschaltpunktes der Automatik (Abb. 15)

> **Anmerkung:**
> Die Auto-Start- und die Auto-Ruckkehr-Positions-Justier-schraube sind zusammen angeordnet. **(Abb. 15)**
> Wenn der Tonarm in der Nahe oder auf der Tonarmablage ist, so ist die Auto-Start-Positions-Justierschraube sichtbar.
> Wenn der Tonarm in der Naha der Plattenmitte ist, so ist die Auto-Ruckkehr-Justierschraube sichtbar. **(Abb. 16)**

Wenn die Abtastnadel nicht in der Einlaufrile aufsetzt, justieren Sie wie folgt.

1. Befestigen Sie den Tonarm mit der Arretierklammer auf der Tonarmablage.
2. Die Gummikappe abnehmen. **(Abb. 15)**
3. Drehen Sie die Justierschraube im Uhrzeigersinn oder entgegen dem Uhrzeigersinn, wie erforderlich.

Falls der Aufsetzpunkt im Wiedergabeteil der Schallplatte liegt:

**—Entgegen dem Uhrzeigersinn drehen.**

Falls der Aufsetzpunkt im außerhalb de Platte liegt:

**—Im Uhrzeigersinn drehen.**

Justieren Sie so, daß die Nadelspitze 1—2mm vom Rand entfen auf der Platte aufsetzt.

### • Justierung des Abschaltpunktes der Automatik (Abb. 16)

(Die Gummikappe abnehmen)

1. Setzen Sie zuerst den Nadelschutz auf.
2. Führen Sie den Tonarm gegen die Plattenmitte.
   Die Justierschraube für den Abschaltpunkt der Automatik wird dann sichtbar.

Falls der tonarm zu früh zurückkehrt.

**—Entgegen dem Uhrzeigersinn drehen.**

Falls der Tonarm nach Erreichen der Auslaufrille nicht zurückkhrt.

**—Im Uhrzeigersinn drehen.**

### • Justierung der Drehzahl

1. Stellen den Drehzahl-Wahlschalter auf die "45" — Position.
2. Drehen VR102 mit einem Schraufenzieher in der Hinterseite des Gerätes, bis die Neundrehzahl (45 U/min) gleicherweise mit eimen stroboskop bestätigt ist. **(Abb. 17)**
3. Stellen den Drehzahl-Wahlschalter auf die "33" — position.
4. Drehen VR101 mit einem Schraubenzieher in der Hinterseite des Gerätes, bis die Neundrehzahl (33—1/3 U/min) unter gleichzeitiger Beobachtung mit stroboskopbestätigt ist. **(Abb. 17)**

## ■ MESURAGES ET RÉGLAGES — Français

### • Mise au point de la hauteur de l'élévateur du brás

La hauteur de l'élévateur du bras (distance entre l'extrémité de la pointe de lecture et la surface du disque, lorsque la commande de pose et de relevage est à la position "▼") a été réglée en usine sur approximativement 5 à 7 mm. **(Fig. 13)**
Si l'écartement est trop étrop ou trop large, tourner la vis de réglage dans le sens des aiguilles d'une montre ou dans le sens contraire. **(Fig. 14)**
**Rotation dans le sens des aiguilles d'une montre.**
– La distance entre la surface du disque et l'extémité de la pointe de lecture diminue.
**Rotation dans le sens contraire des aiguilles d'une montre.**
– La distance entre la surface du disque et l'extrémité de la pointe de lecture augmente.

### • Mise au point de la position de démarrage automatique (Fig. 15)

> **Nota:**
> Les vis de réglage du démarrage automatique et du retour automatiques sont disposées ensemble.
> Lorsque le bras de lecture est sur ou près de l'accoudoir du bras, la vis de réglage de démarrage automatique est visible **(Fig. 15)** ; lorsque le bras de lecture est près du centre d'un disque, la vis de réglage du retour automatique est visible. **(Fig. 16)**

Si la pointe de lecture ne repose pas dans le sillon d'entree, ajuster de la manière suivante.
1. Bolquer le bras de lecture sur le support de bras.
2. Retirer le capuchon en caoutchouc. **(Fig. 15)**
3. Avec un tournevis, tourner la vis de réglage dans le sens des aiguilles d'une montre ou dans le sens inrerselon la nécessite.

Si la tête de la pointe de lecture se dépose trop loin du sillon enregistré,
**—tourner dans le sens contraire des aiguilles d'une montre.**
Si la tête de ia pointe de lecture se dépose en dehors du disque,
**—tourner dans le sens des aiguilles d'une montre.**
Ajuster de façon à ce que l'extrémité de la pointe de lecture atterrisse à 1—2mm à partir du bord du disque.

### • Mise au point de la position de retour automatique (Fig. 16)

(Retirer le capuchon en caoutchouc.)
1. Placer le capot protecteur de la pointe de lecture sur la cellule pick-up.
2. Déplacer le bras de lecture vers le centre du disgue. Alors, la vis de réglage du retour automatique apparaîtra.

Si le bras de lecture tend à revenir vers le support du bras avant que l'audition ne soit terminée.
**—tourner dans le sens contraire des aiguilles d'une montre.**
Si le bras de lecture ne peut revenir en arrière après le dernier sillon.
**—tourner dans le sens des aiguilles d'une montre.**

### • Réglage de la vitesse rotationnelle

1. Régler le commutateur s'electeur de vitesse sur la position "45".
2. Ajuster VR102 avec un tournevis jusqu'à ce qu la vitesse nominale de rotation (45 t/p.m.) soit obtenue tout en la vérifiant par l'intermédiaire du stroboscope. **(Fig. 17)**
3. Régler le commutateur sélecteur de vitesse sur la position "33".
4. Adjuster VR101 avec un tournevis à partir de l'arrière de l'appareil jusqu'à ce que la vitesse nominale de rotation (33 t/p.m.) soit obtenue tout en la vérifiant par l'intermédiaire du stroboscope. **(Fig. 17)**

## ■ MEDICIONES Y AJUSTES — Español

### • Ajuste de la altura de elevación del brazo

La allura de elevación del brazo (o sea, la distancia entre la punta de la aguja y la superificie del disco cuando el control de colocación está en la posición "▼") ha sido regulada en la fábrica aproximadamente entre 5 y 7 mm. **(Fig. 13)**
En caso que la distancia fuese demasiado abundante o demasiado escasa, girar el tornillo de ajuste hacia la derecha o hacia la izqulerda **(Fig. 14)**
**Rotación hacia la derecha**
– reduce la distancia entre el disco y la punta de la aguja.
**Rotación hacia la izquierda**
– aumenta la distancia entre el disco y la punta de la aguja.

### • Ajuste de ia posición para el arranque automático (Fig. 15)

> **Nota:**
> Los respectivos tornillos de ajuste para arranque y retorno automáticos se encuentran juntos.
> Cuando el brazo sonoro está puesto sobre el apoyo o cerca de éste, se dejará ver el tornillo de ajuste del arranque automático **(Fig. 15)**;estando cerca del centro del disco, se dejará ver el de ajuste del retorno automático. **(Fig. 16)**

En caso que la aguja no se depositara en el surco de comienzo, regular de la manera que sigue.
1. Sujetar el brazo sonoro al apoyo del mismo con la grapa.
2. Quitar la tapita de goma. **(Fig. 16)**
3. Girar el tornillito de ajuste hacia la derecha o hacia la izquierda usando un destornillador, según sea necesario.

En caso que la punta de la aguja se deposita muy dentro del surco grabado:
**—Girar hacia la izuquierda.**
En caso que la punta de la aguja se deposita fuera del disco:
**—Girar hacia la derecha.**
Regular de manera tal que la punta de la aguja se deposite a uno o dos milímetros del borde del disco.

### • Ajuste de la posición para retorno automático (Fig. 15)

(Quitar la tapita de goma.)
1. Colocar la protección de la aguja en el cartucho.
2. Mover el brazo sonoro hacia el centro del disco. Con ello, aparecerá el tornillo de ajuste del retorno automático.

Cuando el brazo sonoro tienda a volver a su apoyo antes de terminar la ejecudción:
**— Girar hacia la izquierda.**
En caso que el brazo sonoro no vuelva después de haber tocado el último surco del disco:
**Girar hacia la derecha.**

### • Ajuste de velocidad rotacional

1. Poner el selector de velocidad en la posición "45".
2. Girar el VR102 con un destornillador por detrás del aparato hasta la rotación nominal (45 r.p.m.) y verificar la rotación con un estroboscopio mientras se ajuste la velocidad. **(Fig. 17)**
3. Poner el selector de velocidad en la posición "33".
4. Girar el VR101 con un destornillador por detrás del aparato hasta la rotación nominal (33–1/3) y verificar la rotación con un estroboscopio mientras se ajuste la velocidad. **(Fig. 17)**

## ■ REPLACEMENT PARTS LIST

**Notes:**
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice:
   Components identified by ⚠ mark have special characteristics important for safety.
   When replacing any of these components, use only manufacturer's specified parts.
3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
4. The "S" mark is service standard parts and may differ from production parts.
5. Ⓚ -karked parts are used for black only, while ○ -marked parts are for silver type only.
6. Parts other than Ⓚ -and ○ -marked are used for both black and silver types.
7. The parenthesized number in the column of descriotion stand for the quantity per set.

Black type model No.: SL–B310 (K)

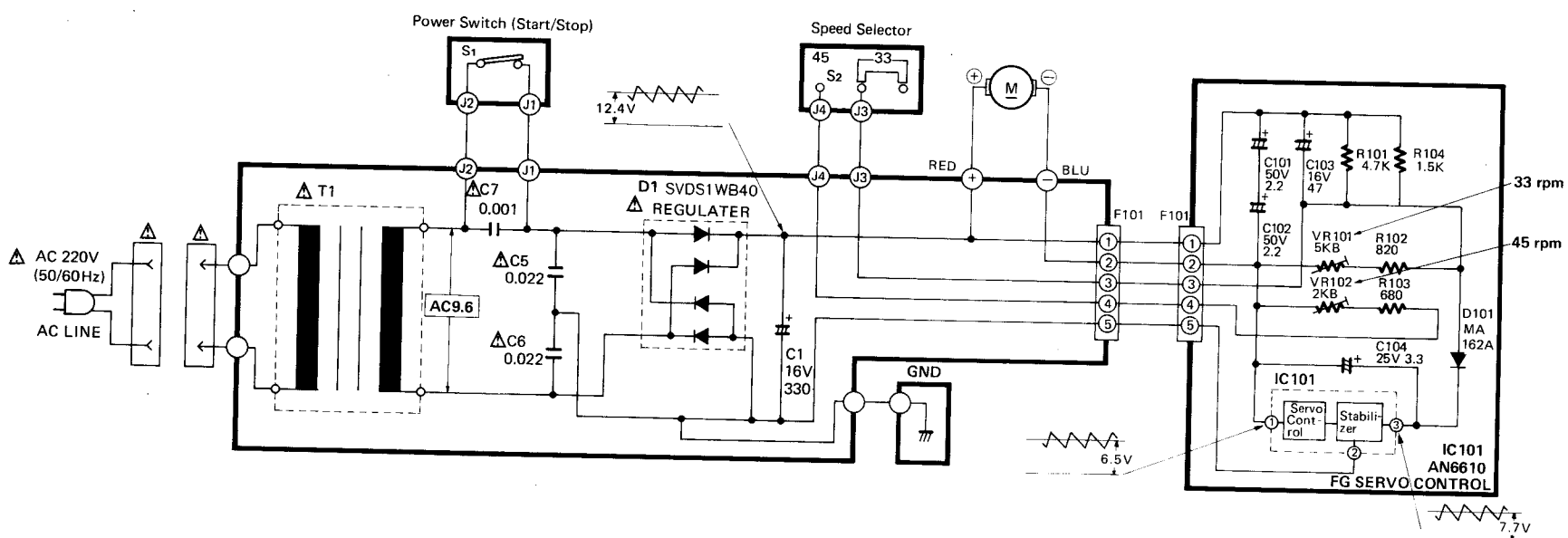
**Areas**

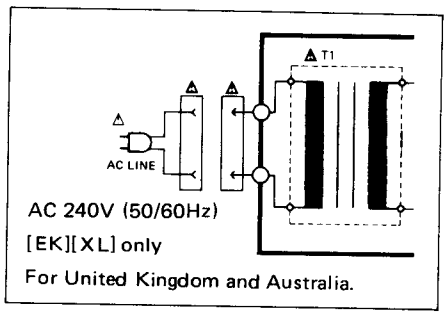
- * [E] is available in Switzerland and Scandinavia.
- * [EK] is available in United Kingdom.
- * [EG] is available in F.R. Germany.
- * [Ei] is available in Italy.
- * [EC] is available in Czechoslovakia.
- * [EB] is available in Belgium.
- * [EH] is available in Holland.
- * [XL] is available in Australia
- * [EF] is available in France.
- * [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
- * [XM] is available in Central South America.

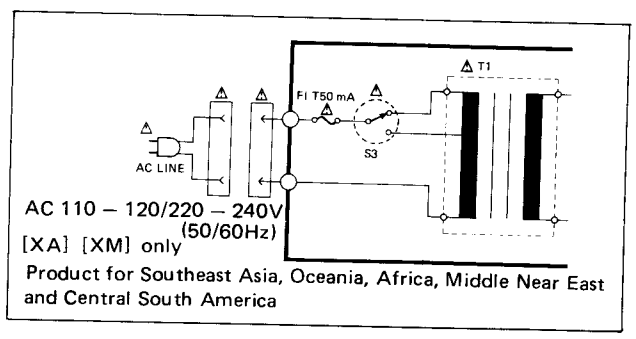
| Ref. No. | Part No. | Description |
|---|---|---|
| **CABINET and CHASSIS PARTS** | | |
| 1 | SFADZ15R01 | Dust Cover (1) |
| 2 | SFGZZ15R01 | Cushion Rubber, Dust Cover (2) |
| 3 | SFTGDP3N01 | Turntable Mat (1) |
| 4 | SFTEB73R01A | Turntable Platter (1) |
| 5 | SFUMB33N20A | Record Size Detector (1) |
| 6 | SFUZD33-01E | Latch, Record Size Detector (2) |
| 7 | SFGB321-1 | Belt (1) |
| 8 | SFAUZ15R01 | Bottom Board (1) |
| 9 | SFGAZ15R01 | Audio Insulator (Front) (2) |
| 10 | SFGABL3N01 | Audio Insulator (Rear) (2) |
| 11 | SFKKB73R01 | Surface Plate (1) |
| 12 ○ | SFACB73R01 | Cabinet (Silver) (1) |
| 12 Ⓚ | SFACB73R21 | Cabinet (Black) (1) |
| 13 | SFATZ15R01A | Hinge (2) |
| 14 [E, EC] | SFNNB73S01 | Name Plate (1) |
| 14 [EK, XL] | SFNNB73G01 | Name Plate (1) |
| 14 [XA, XM] | SFNNB73X01 | Name Plate (1) |
| 14 [Other Areas] | SFNNB73R01 | Name Plate (1) |
| 15 | SFDJZ15R01 | Jack, Phono Output (1) |
| 16 | SFUZB63M01 | Rod, Start/Stop (1) |
| 17 | SFQHZ15R01 | Spring, Start /Stop Buttom (1) |
| 18 | SFKTZ15R01 | Button, Start /Stop (1) |
| 19 | SFUPZ15R03 | Lever, Cueing (1) |
| 20 | SFKTZ15R04 | Knob, Cueing Lever (1) |
| 21 | SFQPZ15R02 | Spring, Cueing Lever Knob (1) |
| 22 | SFYB-5-32 | Ball, Cueing Lever Knob (1) |
| 23 | SFUPZ15R05 | Plate, Cueing Lever Knob (1) |
| 24 | SFKTZ15R02 | Knob, Speed Selector Switch (1) |
| 25 | SFUMZ15R01 | Cover, Motor (1) |
| 26 | SFMHZ15R01E | Motor (1) |
| 27 [XA, XM, XL] ⚠ | SFDJHSC0509 | Socket, AC Cord (1) |
| 27 [EK] ⚠ | SFDJHSC0492 | Socket, AC Cord (1) |
| 27 [Other Areas] ⚠ | SFDJHSC0505 | Socket, AC Cord (1) |
| 28 [XA, XM] | SJT347 | Hold |
| **TONEARM PARTS** | | |
| 40 ○ | SFPAMZ1501A | Tonearm Ass'y (1) (Silver) |
| 40 Ⓚ | SFPAMZ1502A | Tonearm Ass'y (1) (Black) |
| 41 | EPC-P27SK | ★Cartrige (1) |
| 42 | EPS-27CS | ★Stylus (1) |
| 43 | SFCNC02301 | Cover, Stylus (1) |
| 44 | SFKUB63M01E | Arm Rest (1) |
| 45 ○ | SFGK170-01 | Cap, Rubber (Silver) (1) |
| 45 Ⓚ | SFGK171F01 | Cap, Rubber (Black) (1) |
| 46 | SFKKZ15R01 | Plate, Canceler (1) |
| 47 | SFUMZ15R58 | Cover, Arm Lift (1) |
| 48 | SFQAZ15R52 | Spring, Arm Lift (1) |
| 49 | SFUPB63M51A | Plate, Arm Lift Ass'y (1) |
| 50 | SFUPB63M52A | Plate, Pu Fixing Ass'y (1) |
| 51 | SFQHZ15R55 | Spring (1) |
| 52 | SFQHB63M56 | Spring (1) |

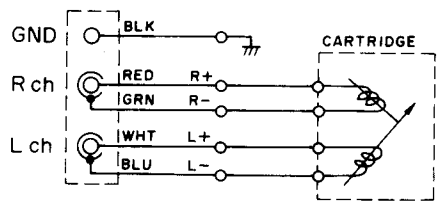
11

## ■ SCHEMATIC DIAGRAM ( This schematic diagram may be modified at any time with the development of new technology.)



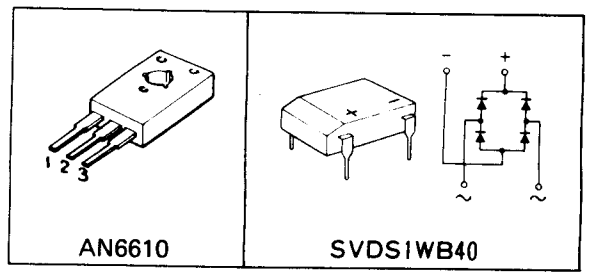




**Notes:**

1. **S1** : Power (Arm) switch in "**on**.. position.
2. **S2** : Speed selector switch in **"33-1/3 rpm"** position
   33-1/3 rpm ⟷ 45 rpm
3. **S3**: Voltage selector switch in "220–240V" position
4. The value and waveform in ▭ are of the reference voltage for the turntable rotation (33-1/3 rpm) of this unit, measured by DC voltmeter (high impedance) and osilloscope on the basis of chassis.
   Therefore the measured value may include some error, depending on the internal impedance of DC circuit tester and other conditions.
5. Important safety notice:
   Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

- **Terminal guide IC and diodes.**

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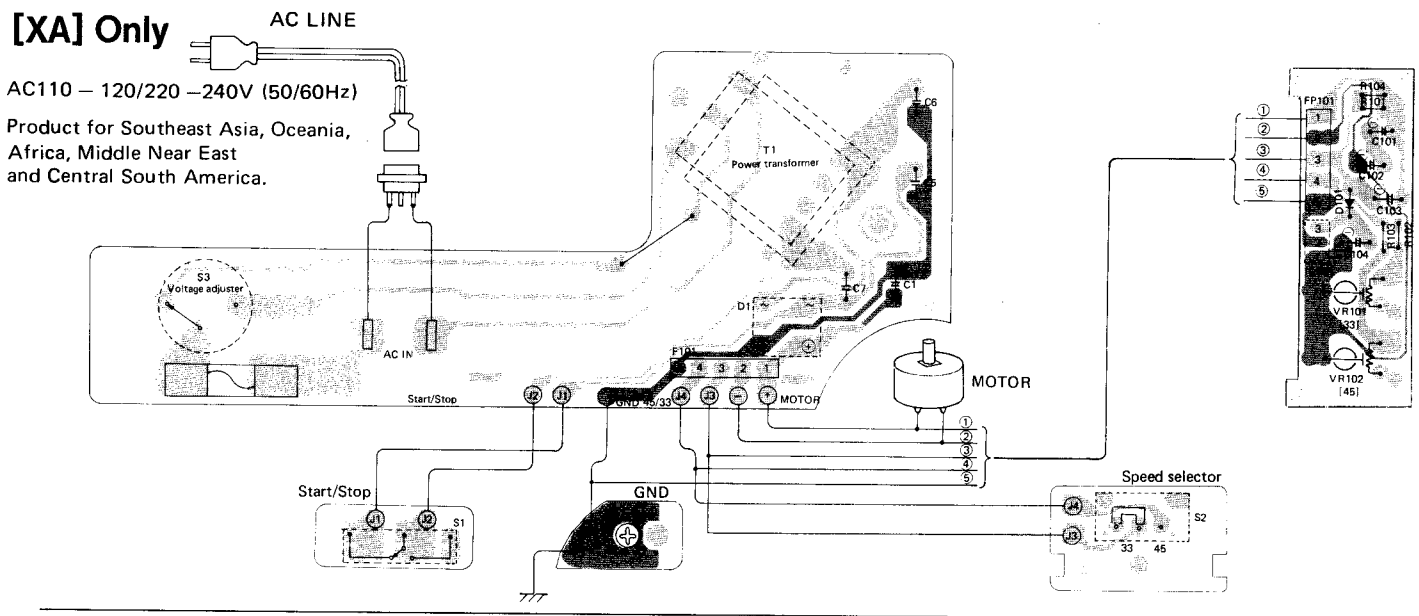
## ■ CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM

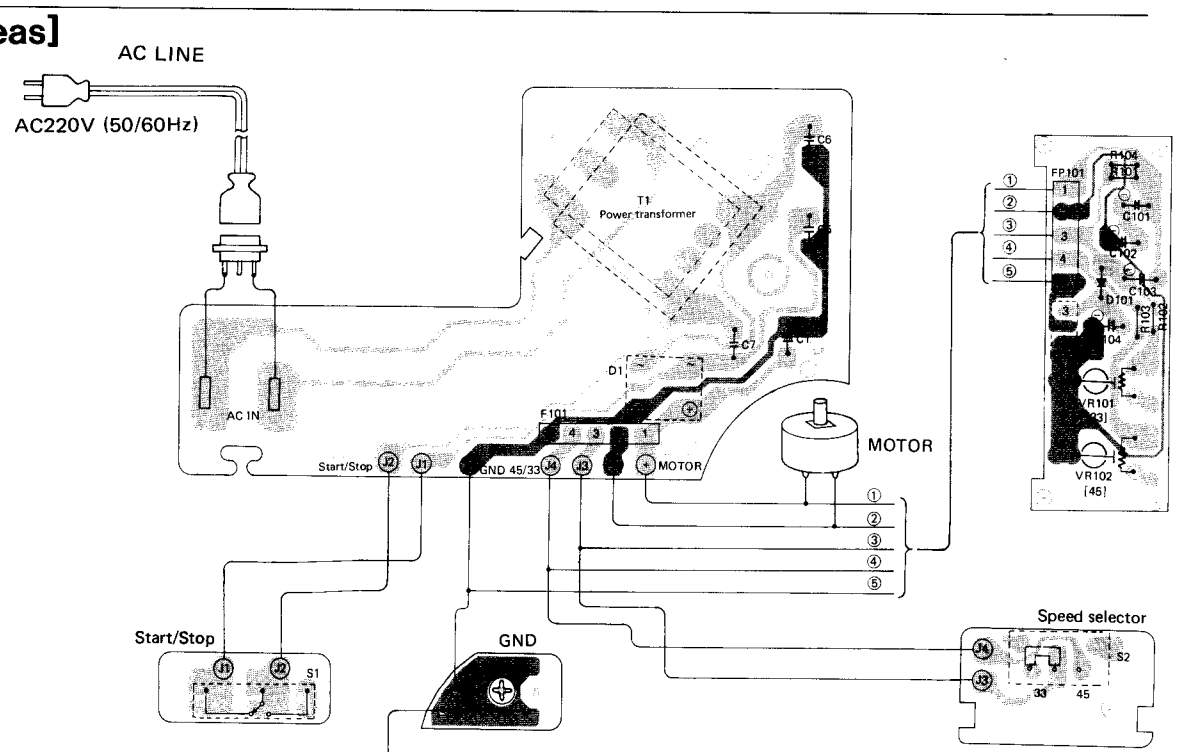
■ Ground (Earth Lines)

| Ref. No. | Part No. | Description |
|---|---|---|
| **INTEGRATED CIRCUIT** | | |
| IC101 | AN6610 | Servo Control |
| **DIODES** | | |
| D1 ⚠ | SVDS1WB40 | Rectifier |
| D101 S | MA162A | Switch |
| **VARIABLE RESISTORS** | | |
| VR101 | EVN51AA00B53 | Speed Adjustment 5KΩ(B) |
| VR102 | EVN51AA00B23 | Speed Adjustment 2KΩ(B) |
| **SWITCHES** | | |
| S1 ⚠ | SFDSSS5GLP | ON/OFF |
| S2 | SFDSHSW0739 | Speed Selector |
| S3 [XA, XM] ⚠ | SFDSHXW02066 | Voltage Selector |
| **POWER TRANSFORMER** | | |
| **T1** [EK, XL] ⚠ | SLTF6648 | Power Source |
| **T1** [XA, XM] ⚠ | SLT35K63E | Power Source |
| **T1** [Other Areas] ⚠ | SLT35K59E | Power Source |
| **FUSE** | | |
| F1 [XA] only ⚠ | XBA2C005T1A | T50mA 250V |
| **RESISTORS** | | |
| R101 Ⓢ | ERD25FJ472 | Carbon 4.7KΩ 1/4W |
| R102 Ⓢ | ERD25FJ821 | Carbon 820Ω 1/4W |
| R103 Ⓢ | ERD25FJ681 | Carbon 680Ω 1/4W |
| R104 Ⓢ | ERD25FJ152 | Carbon 1.5KΩ 1/4W |
| **CAPACITORS** | | |
| **C1** [XA, XM] S | ECEA1ES331 | Electrolytic 330μF 25V |
| **C1** [Other Areas] S | ECEA1CS331 | Electrolytic 330μF 16V |
| C5,6 S ⚠ | ECKD1H223PF | Ceramic 0.022μF 50V |
| C7 S ⚠ | ECKD2H102KB | Ceramic 0.001μF 500V |
| C101, 102 S | ECEA50Z2R2 | Electrolytic 2.2μF 50V |
| C103 S | ECEA1ES470 | Electrolytic 47μF 25V |
| C104 S | ECEA50Z3R3 | Electrolytic 3.3μF 50V |

**[XA] Only**

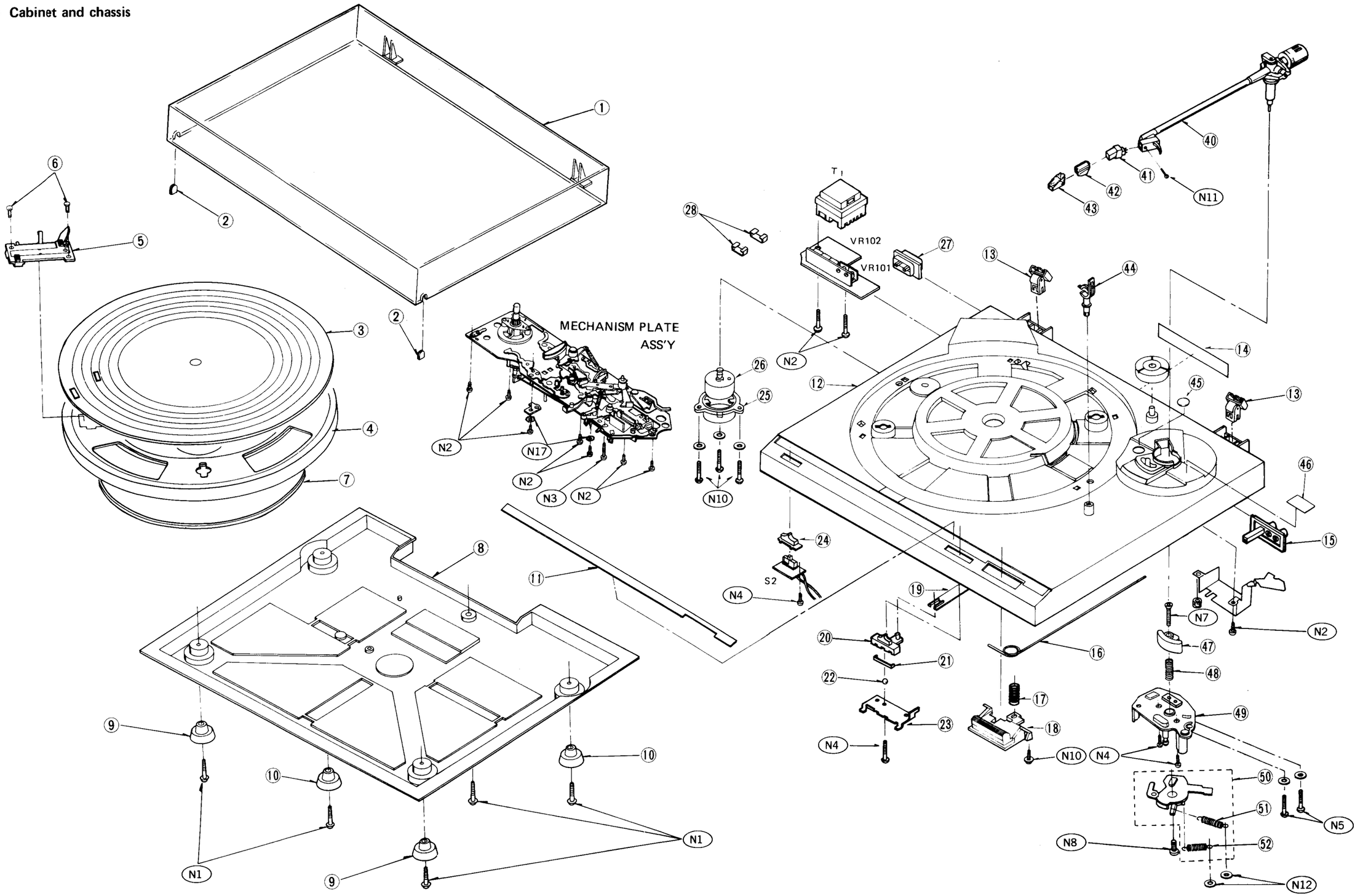



**[Other Areas]**



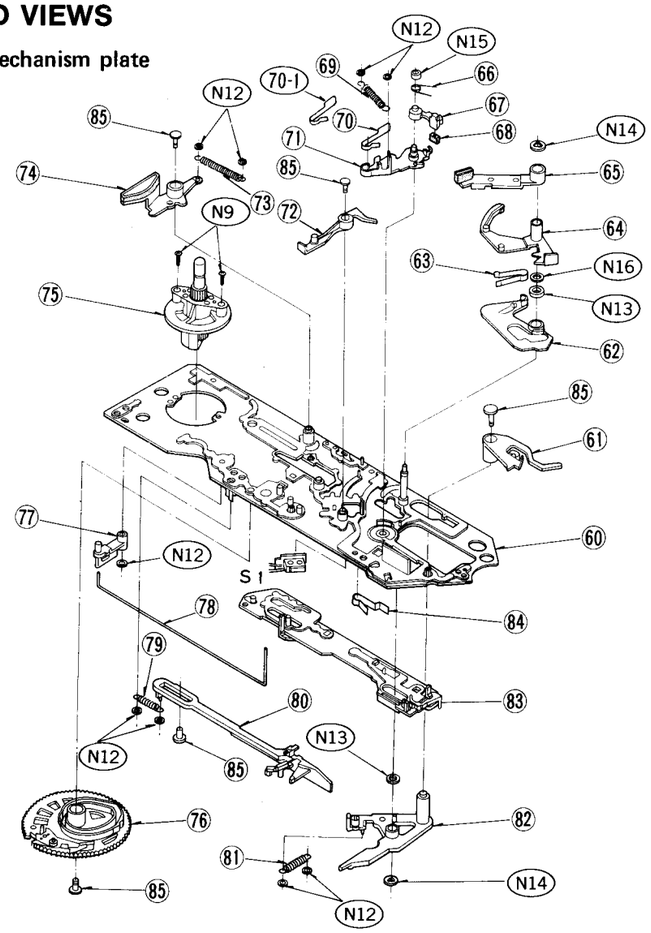
## ■ EXPLODED VIEWS

- **Cabinet and chassis**



## ■ EXPLODED VIEWS

- Automatic mechanism plate




| Ref. No. | Part No. | Description |
|---|---|---|
| **AUTOMATIC MECHANISM PLATE PARTS** | | |
| 60 | SFUKB63M51E | Plate Ass'y, Automatic Mechanism (1) |
| 61 | SFUMB63M65 | Guide, Switch Lever (1) |
| 62 | SFUMB63M62 | Sub Plate, Index (1) |
| 63 | SFQPB63M53 | Spring, Sub Plate Index (1) |
| 64 | SFUMB63M63 | Plate (A), Index (1) |
| 65 | SFUMB63M64E | Plate (B) Ass'y, Index (1) |
| 66 | SFQSB63M52 | Spring, Brake Lever (1) |
| 67 | SFUMB63M61 | Lever, Brake (1) |
| 68 | SFUZB63M52 | Felt, Brake Lever (1) |
| 69 | SFQHB63M52 | Spring, Cueing Cam (1) |
| 70 | SFQPB63M52 | Spring, Cueing Cam (1) |
| 70-1 | SFQPB63M54 | Spring, Cueing Cam (1) |
| 71 | SFUMB63M60 | Cam, Cueing (1) |
| 72 | SFUMB63M59 | Lever, Cueing (1) |
| 73 | SFQHB63M53 | Spring, Record Size Detector (1) |
| 74 | SFUMB63M57E | Record Size Detector Ass'y (1) |
| 75 | SFTUB63M51A | Turntable Shaft Ass'y (1) |
| 76 | SFUGB63M51E | Main Gear Ass'y (1) |

| Ref. No. | Part No. | Description |
|---|---|---|
| **AUTOMATIC MECHANISM PLATE PARTS** | | |
| 77 | SFUMB63M54 | Lever, Drive Operation (1) |
| 78 | SFQSB63M51 | Rod, Drive Operation (1) |
| 79 | SFQHB63M51 | Spring, Cancell Lever Ass'y (1) |
| 80 | SFUMB63M53E | Lever Ass'y, Cancell (1) |
| 81 | SFQHB63M52 | Spring, Switch Lever Ass'y (1) |
| 82 | SFUMB63M55E | Lever Ass'y, Switch (1) |
| 83 | SFUBB63M51E | Plate Ass'y Drive (1) |
| 84 | SFQPB63M51 | Spring, Drive Plate Ass'y (1) |
| 85 | SFUMZ15R56 | Pin (6) |
| **SCREWS and WASHERS** | | |
| N1 | XTW3+14QFYR | Screw, +3×14 (5) |
| N2 S | XTV3+10BFN | Screw, +3×10 (7) |
| N3 | XTV3+30J | Screw, +3×30 (1) |
| N4 S | XTV3+8BFN | Screw, +3×8 (5) |
| N5 | XYN3+F12 | Screw, +3×12 (2) |
| N6 | XYE3+EJ8 | Screw, +3×8 (1) |
| N7 | XTS3+16FFZ | Screw, +3×16 (1) |
| N8 | XYC3+CG8 | Screw, +3×8 (1) |
| N9 S | XTV3+12BFN | Screw, +3×12 (2) |
| N10 | SFXGB33N01 | Screw (4) |
| N11 | SFPEV0P301 | Screw (1) |
| N12 | SFXWZ15R51 | Washer (11) |
| N13 | SFXWB63M51 | Washer (2) |

| Ref. No. | Part No. | Description |
|---|---|---|
| **SCREWS and WASHERS** | | |
| N14 | SFXWB63M52 | Washer (2) |
| N15 | SFUMZ15R61 | Washer (1) |
| N16 | SFXWQ34N22 | Washer (1) |
| N17 S | XWC3B | Washer (1) |
| N18 | SFUMZ15R61 | Washer (1) |
| **ACCESSORIES** | | |
| **A1** (EK) | SFNUB73G01 | Instruction Book (1) |
| **A1** (XL, XA, XM) | SFNUB73X01 | Instruction Book (1) |
| **A1** (EG) | SFNUB73R01 | Instruction Book (1) |
| **A1** (EF) | SFNUB73F01 | Instruction Book (1) |
| **A1** (Ei) | SFNUB73i01 | Instruction Book (1) |
| **A1** (Other Areas) | SFNUB73S01 | Instruction Book (1) |
| A2 | SFWE212-01 | 45 r.p.m Adapter (1) |
| **A3** (EK) ⚠ | SFDAC05G02 | AC Cord (1) |
| **A3** (XL) ⚠ | SFDAC05L01 | AC Cord (1) |
| **A3** (XA, XM) ⚠ | SFDAC05X01 | AC Cord (1) |
| **A3** (Other Areas) ⚠ | SFDAC05E02 | AC Cord (1) |
| **A4** (XL) ⚠ | SFDLC05N01 | Ground Wire (1) |
| **A4** (Other Areas) | SFDLZ15R01 | Ground Wire (1) |
| A5 | SFDHC05N01 | Phono Cord (1) |
| A6 (XA, XM) ⚠ | SFDKi19118 | 2P Plug (1) |

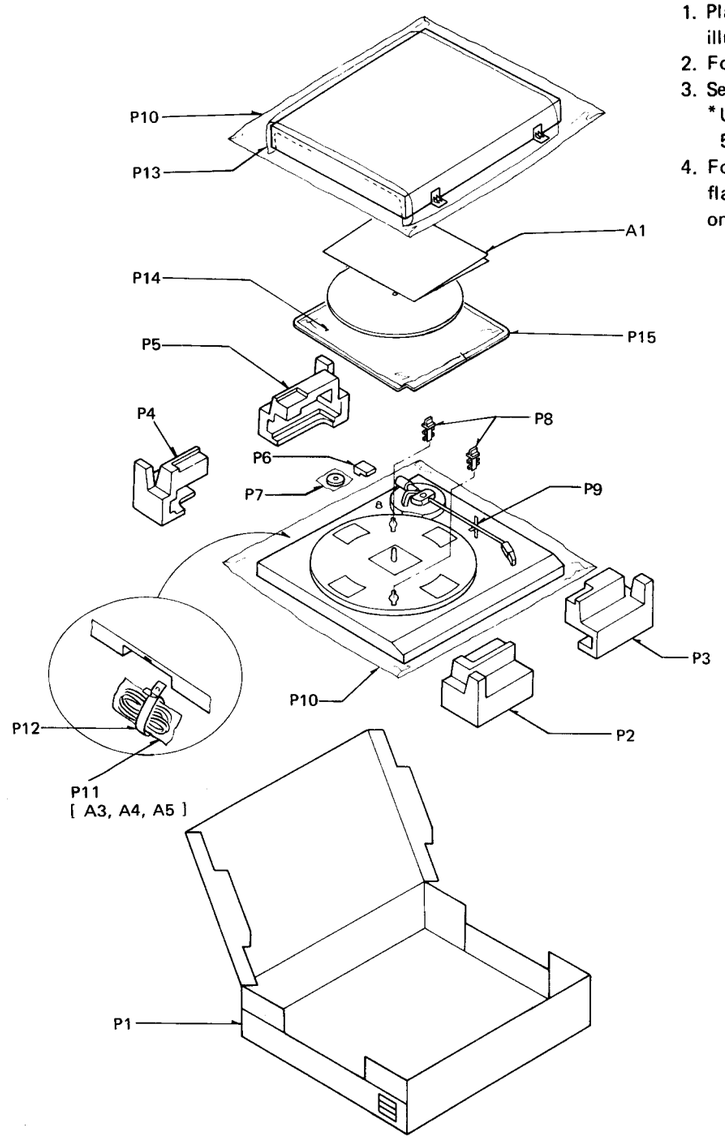


## ■ PACKINGS

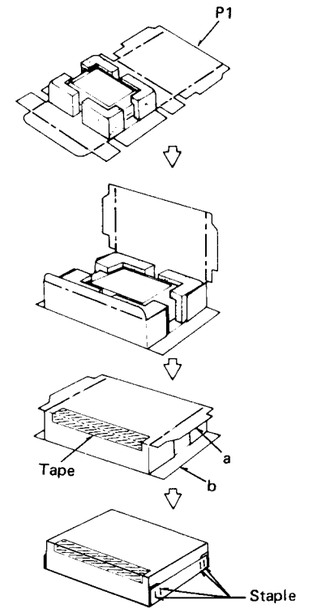
| Ref. No. | Part No. | Description |
|---|---|---|
| **PACKING PARTS** | | |
| **P1** (EF) ◯ | SFHPB73F01 | Carton Box (Silver) (1) |
| **P1** (Other Areas) Ⓚ | SFHPB73R01 | Carton Box (Silver) (1) |
| **P1** (EF) ◯ | SFHPB73F21 | Carton Box (Black) (1) |
| **P1** (Other Areas) Ⓚ | SFHPB73R21 | Carton Box (Black) (1) |
| P2 | SFHHB63M01 | Pad, Front (Left) (1) |
| P3 | SFHHB63M02 | Pad, Front (Right) (1) |

| Ref. No. | Part No. | Description |
|---|---|---|
| **PACKING PARTS** | | |
| P4 | SFHHB63M03 | Pad, Rear (Left) (1) |
| P5 | SFHHB63M04 | Pad, Rear (Right) (1) |
| P6 | SFHZZ15R01 | Pad, Weight (1) |
| P7 | SFYF05A06 | Polyethylene Bag, 45 r.p.m Adoptor (1) |
| P8 | SFHKB63M01 | Clamper, Turntable Platter (1) |
| P9 | SFHZB63M01 | Clamper, Tonearm (1) |

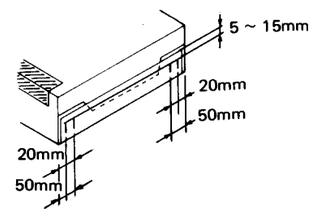
| Ref. No. | Part No. | Description |
|---|---|---|
| **PACKING PARTS** | | |
| P10 | SFYH60×60 | Polyethylene Bag, Unit/Dust Cover (2) |
| P11 | SFYH17×16 | Polyethylene Bag, AC Cord (1) |
| P12 | SFHZZ15R02 | Stopper, AC Cord (1) |
| P13 | SFHZD03M01 | Sheet (1) |
| P14 | SFYF30B35 | Polyethylene Bag, Turntable Mat (1) |
| P15 | SFHDZ15R01 | Pad, Turntable Mat (1) |




1. Plase the unit (with cushions attached) as illustrated.
2. Fold the flaps according to the line marks.
3. Seal the top with adhesive tape.
   *Use gum tape or adhesive cloth tape of 50mm wide at least.
4. For the edges, first fold the flap "a" and then flap "b", and staple. Remember to staple only flap "b". (Use 15 or 16mm staple)




* Stapling positions are shown below.



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